AUTOMOTIVE GRADE

COMPLIANT

HALOGEN FREE

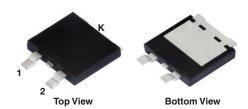


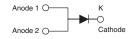
Vishay General Semiconductor

Low-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.26 \text{ V}$ at $I_F = 5 \text{ A}$

eSMP[®] Series SMPD (TO-263AC)





ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS			
I _{F(AV)}	40 A		
V _{RRM}	45 V		
I _{FSM}	240 A		
V _F at I _F = 40 A (T _A = 125 °C)	0.53 V		
T _J max.	150 °C		
Package	SMPD (TO-263AC)		
Circuit configuration	Single		

FEATURES

- Trench MOS Schottky technology
- Very low profile typical height of 1.7 mm
- Ideal for automated placement
- · Low forward voltage drop, low power losses
- · High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 - Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

MECHANICAL DATA

Case: SMPD (TO-263AC)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,....)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	V40DL45	UNIT		
Maximum repetitive peak reverse voltage	V_{RRM}	45	V		
Maximum average forward rectified current (fig. 1)	I _{F(AV)} (1)	40	Α		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM} 240		А		
Operating junction and storage temperature range	T _J , T _{STG}	-40 to +150	°C		



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	- V _F ⁽¹⁾	0.38	-	- V
	I _F = 20 A			0.47	-	
	I _F = 40 A			0.58	0.66	
	I _F = 5 A	T _A = 125 °C		0.26	-	
	I _F = 20 A			0.38	-	
	I _F = 40 A			0.53	0.61	
Reverse current	V 45 V	T _A = 25 °C	I _R (2)	-	5	- mA
	$V_{R} = 45 \text{ V}$	T _A = 125 °C		36	125	

Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

⁽²⁾ Pulse test: pulse width \leq 5 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)				
PARAMETER SYMBOL V40DL45			UNIT	
Typical thermal resistance	$R_{ heta JC}$	0.9	°C/W	
	R ₀ JA (1)(2)	45	7 0/1	

Notes

(1) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP_D/dT_J < 1/R_{θ,JA}

(2) Free air, without heatsink

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V40DL45-M3/I	0.54	I	2000/reel	13" diameter plastic tape and reel	
V40DL45HM3_A/I (1)	0.54	I	2000/reel	13" diameter plastic tape and reel	

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

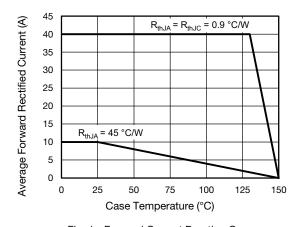


Fig. 1 - Forward Current Derating Curve

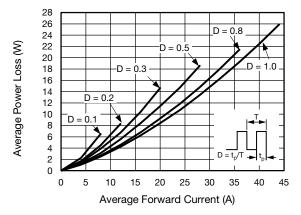


Fig. 2 - Forward Power Loss Characteristics



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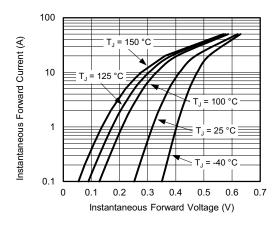


Fig. 3 - Typical Instantaneous Forward Characteristics

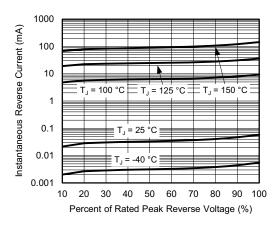


Fig. 4 - Typical Reverse Characteristics

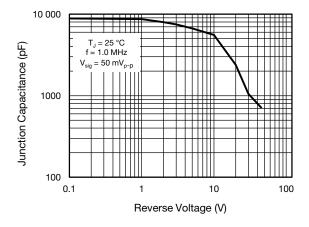


Fig. 5 - Typical Junction Capacitance

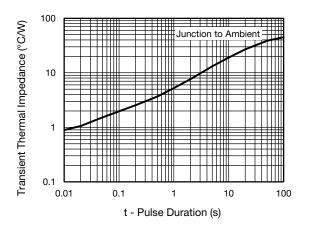


Fig. 6 - Typical Transient Thermal Impedance

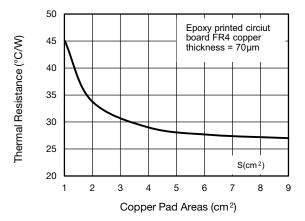


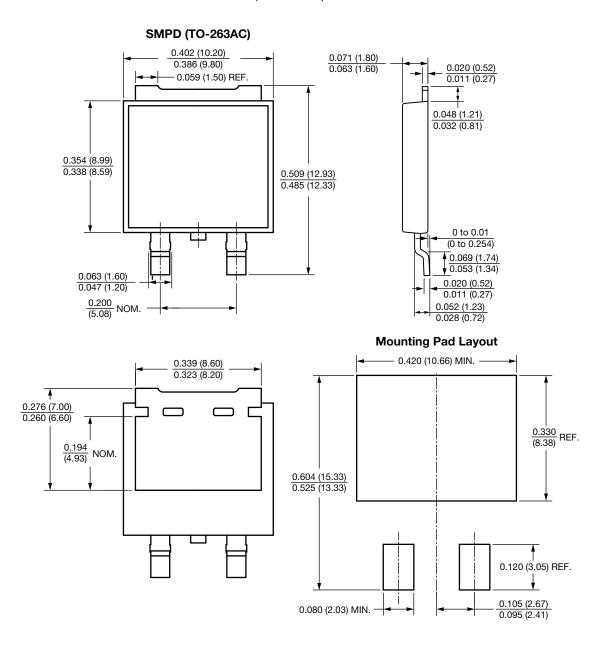
Fig. 7 - Thermal Resistance Junction-to-Ambient vs.

Copper Pad Areas



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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